BLOOD BANK		
Test	**Specimen**	**Comments**
Antibody Screen(IAT)	5 mL Purple Top	Critical Value - Positive - Critical Value
Antibody Identification	(2) 5 mL Purple Tops	Critical Value - Positive - Critical Value
Antibody Titer	5 mL Purple Top	Critical Value - Positive - Critical Value
Blood Group (ABO/Rh)	5 mL Purple Top	One purple microtainer needed on infants
Direct Antiglobulin (DAT)	3 mL Purple Top	Critical Value - Positive - Critical Value

CHEMISTRY TESTS - NOTE: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes			
Chemistry & Special Chemistry Tests	**Specimen**	**Reference Range**	**Comments**
Acetaminophen	Plasma	10 - 30 ug/mL	Heparinized (lithium heparin) plasma Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Albumin	Plasma	3.5 - 4.8 g/dL	Heparinized (lithium heparin) plasma
Alcohol	Whole Blood	None Detected	Alcohol testing for medical purposes is processed as a clinical specimen. If a legal blood alcohol test is required a specimen chain of custody is required; results are released through the MDG Patient Release Information Department.
ALKP	Plasma	38 - 126 IU/L	Heparinized (lithium heparin) plasma
AFP-Tumor Marker	Serum	0 - 8 ng/mL	
ALT (SGPT)	Plasma	Male: 30 - 65 IU/L Female: 14 - 54 IU/L	Heparinized (lithium heparin) plasma
Allergy Testing (IgE, RAST, Regional Panels, individual allergens)			

Ammonia	Plasma	11 - 32 umol/L	Collect the specimen using standard Venipucture technique and immediately place on ice. Transport to the laboratory immediately for processing and testing. Heparinized (lithium heparin) plasma is the recommended specimen. The tube should be completely filled, stored tightly capped on ice, centrifuged immediately
Amylase	Plasma	25 - 115 IU/L	Heparinized (lithium heparin) plasma
AST (SGOT)	Plasma	15 37 IU/L	Heparinized (lithium heparin) plasma
Beta-HCG	Serum	<5 mIU/mL	Heparinized (lithium heparin) plasma
Bilirubin, Direct	Plasma	0-1 week <0.9 mg/dl Adult:0.1 - 0.5 mg/dL	Heparinized (lithium heparin) plasma
Bilirubin, Total	Plasma	1 wk-1 mo: <0.7 mg/dL 1 mo - 18 yrs: <2.0 mg/dl Adult: 0.4-2.0 mg/dL	Heparinized (lithium heparin) plasma
Blood Urea Nitrogen (BUN)	Plasma Urine	7 - 18 mg/dl 12 - 20 gm/24 hrs	Heparinized (lithium heparin) plasma
Calcium	Plasma . Urine	0 - 1 yr: <9 - 10.9 mg/dl Adult: 8.5 - 10.1 mg/dl 100 - 300 mg/24hrs	**Critical Value (plasma-all ages): <6.9 or >13.1 mg/dl** Random urine specimens are not routinely tested for calcium. Coordinate special requests (e.g. pediatric pseudo-hypothyroidism) with lab. Heparinized (lithium heparin) plasma is the recommended specimen. Sample should be separated from red cells and analyzed promptly

Carbamazepine	Plasma	4 - 12 ug/mL	**Critical Value: >15.1 ug/mL** Heparinized (lithium heparin) plasma; Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
CEA	Serum	Male: 0 - 3.4 ng/ml Female: 0 - 2.5 ng/ml	Carcinoembryonic Antigen
Chloride	Plasma Urine	100-108 mmol/L 110-250 mmol/L	Heparinized (lithium heparin) plasma
Cholesterol	Plasma	<200 mg/dl	Heparinized (lithium heparin) plasma after a 12-hour period of fasting; plasma should be removed from cells within 2 hours of venipuncture
Cholesterol, HDL	Plasma	Male: 29 - 71 mg/dl Female 35 - 85 mg/dl	
Cholesterol, LDL	Plasma	< 130 mg/dl Desirable 130 - 159 mg/dl Borderline High Risk >160 mg/dl High Risk	This is a calculated value and is only provided as part of lipid panel
CK (CPK)	Serum	Male: 21 - 232 IU/L Female: 38 - 234 IU/L	Heparinized (lithium heparin) plasma
CK-MB	Plasma	<5.0 ng/mL	Heparinized (lithium heparin) plasma
CO2	Plasma	1 day-1 yr: 16-28 mmol/L Adult: 21-32 mmol/L	**Critical Value (all ages): <10.9 or >40.1 mmol/L** Heparinized (lithium heparin) plasma
Cortisol	Serum	A.M: 5 -25 ug/dL P.M.: Half of a.m. values	
Creatinine	Serum/Plasma Urine	Male: 0.6- 1.3mg/dL Male: 800-2000mg/24hrs Female: 600-1800 mg/24 hrs	Heparinized (lithium heparin) plasma
Creatinine Clearance	Urine and Plasma		In order to calculate on a timed urine a specimen, plasma creatinine must be received within 24 hours of urine

			collection.
Digoxin	Serum/Plasma	0.8 - 1.5 ng.mL	**Critical Value: >2.1 ug/mL** Heparinized (lithium heparin) plasma
Estradiol	Serum	Males: 0-56 pg/mL Females: Untreated Postmenopausal…ND-30 pg/mL Treated Postmenopausal….ND-93 pg/mL	Menstruating female (by day is cycle relative to LH peak)
Ferritin	Serum	Male: 3 - 244 ng/mL	Heparinized (lithium heparin) plasma
Folate	Serum	Normal: 3 - 17 ng/ml	
Follicle Stimulating Hormone (FSH)	Serum	Males: 0.7-11.1 mIU/mL Females: Follicular Phase: 2.8 - 11.3 mIU/mL Mid-Cycle Peak: 5.8 - 21.0 mIU/mL Luteal Phase: 1.2 - 9.0 mIU/mL Postmenopausal: 21.7 - 153 mIU/mL	
Free T3	Serum	1.8 - 4.2 pg/ml	
Free T4	Serum	0.8 - 1.9 ng/dL	
Gentamicin	Plasma	Peak: 5-8 ug/mL Trough: <1 ug/mL Indicate time of collection and label peak or trough	Trough samples should be drawn immediately prior to dose administration. Peak samples should be drawn one hour after dose administration Heparinized (lithium heparin) plasma; Non gel tube is recommended.
GGT (GGTP)	Plasma	5 - 85 IU/L	Heparinized (lithium heparin) plasma

Glucose	Plasma Urine CSF	70 - 110mg/dL	**Plasma Critical Value: <40 or >500 mg/dL** Heparinized (lithium heparin) plasma; Immediate separation of plasma from cells is recommended
Hemoglobin A1C (HgbA1C)	Whole Blood	4.7 - 6.4%	
Hepatitis			
Anti-HBs	Serum	Positive if immunized	
HBsAg	Serum	Negative	
HBsAg Confirmatory	Serum	Negative	
HBc Total	Serum	Negative	
HBc IgM	Serum	Negative	
HBeAg	Serum	Negative	
Anti-Hbe	Serum	Negative	
HCV	Serum	Negative	
HAV Total	Serum	Negative	
HAV IgM	Serum	Negative	
Immunoglobulin IgG IgA IgM	Plasma	791-1643 mg/dL 66 - 436 mg/dL 43 - 279 mg/dL	Heparinized (lithium heparin) plasma Specimens should be free of particulate matter.
Iron	Plasma	Male: 35 - 150 mg/dL	Serum is the recommended specimen. Specimens should be collected after a 12-hour period of fasting. . Serum should be removed from cells within three hours of venipuncture
Ketones	Plasma Urine	Negative Negative	

Lactate (Lactic Acid)	Plasma	0.4 - 2.0 mmol/L	Collection of a satisfactory specimen for lactate analysis requires special procedures to prevent changes in lactate while and after the specimen is drawn. The patient should be fasting and at complete rest. Blood is best collected without stasis in a container of sodium fluoride/potassium oxalate, followed by immediate chilling of the specimen and separation of the cells within 15 minutes. Avoid hemolysis
LD (LDH)	Serum/Plasma	100 - 190 IU/L	Heparinized (lithium heparin) plasma
Lipase	Serum/Plasma	114 - 286 IU/L	Heparinized (lithium heparin) plasma
Lithium	Serum	0.6 - 1.2 mmol/L	0.6 1.2 mmol/L is the therapeutic range. >1.5 mmol/L potentially toxic. >2.5 mmol/L can result in Severe Toxicity. Serum is the recommended specimen. Heparinized (lithium heparin) plasma samples should not be used. Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Leutenizing Hormone (LH)	Serum	Males: 0.8 1.6 mIU/mL Females: Follicular Phase: 1.10 - 11.6 mIU/mL Mid-Cycle Peak: 17.0 - 77.0 mIU/mL Luteal Phase: ND - 14.7 mIU/mL Postmenopausal: 11.3 - 39.8 mIU/mL Contraceptives: ND - 8.0 mIU/mL	
Magnesium	Plasma Urine	1.8 - 2.5 mg/dL	**Critical Value: <0.9 or >5 mg/dL** Heparinized (lithium heparin) plasma
Microalbumin, Urine	24 Hour Urine	<1.9 mg/dL	

Microprotein	Urine (24 hrs) Urine (Random)	50-100 mg/24 hr <10 mg/dL	
Osmolality	Serum/Plasma Urine	275-295 mOsm/L 300-900 mOsm/L	
Panels			
Basic Metabolic	Plasma	See values given for individual tests	Basic Metabolic = Ca, CO2, Cl, Cr, Glu, K, Na, BUN GLOMERULAR FILT RATE
Comprehensive Metabolic	Plasma	See values given for individual tests	Comprehensive Metabolic = Alb, Tbil, Ca, CO2, CI, Cr, Glu, ALP, K, TP, Na, ALT, AST, BUN GLOMERULAR FILT RATE
Electrolyte	Plasma	See values given for individual tests	Electrolyte = Na, K, CI, CO2
Hepatic Function	Plasma	See values given for individual tests	Hepatic Function = Alb, TBil, DBil, Phos, TP, ALT, AST
Lipids	Plasma	See values given for individual tests	Lipids = Chol, Trig, HDL, LDL
Renal Function	Plasma	See values given for individual tests	Renal Function = Alb, Ca, CO2, Cl, Cr, Glu, Phos, K, Na, BUN
Quad Screen (Prenatal)		See values given for individual tests	uE3, hCG, AFP, inhibin-A
Iron	Plasma	See values given for individual tests	Iron = Iron, IBC Total, IBC Unsat, Iron SAT, Transferrin
Phenobarbitol	Plasma	15 - 40 ug/mL	**Critical Value: >40.1 ug/mL** Heparinized (lithium heparin) plasma Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Phenytoin	Plasma	10 - 20 ug/mL	**Critical Value: >21 ug/mL** Heparinized (lithium heparin) plasma Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.

Phosphorus	Plasma Urine	1-5 yr: 3.4-5.9 mg/dL 5-10 yr.2.9-5.9 mg/dL 10-15yr: 3.3-6.2 mg/dL Adult: 2.4-4.7 mg/dL	**Plasma Critical Value: <1.1 or >9 mg/dL** Heparinized (lithium heparin) plasma
Potassium	Plasma Urine	1 day-1mo: 3.9-6.9 1 mo-1yr: 3.6-6.8 mmol/L 1-5 yr: 3.2-5.7 mmol/L 5-10 yr: 3.4-5.4 mmol/L 10-15 yr: 3.5-5.1 mmol/L Adult: 3.6-5.1 mmol/L	**Plasma Critical Value (other ages): <3 or >6.6 mmol/L** Heparinized (lithium heparin) plasma
Prealbumin	Plasma	18 - 38 mg/dL	Heparinized (lithium heparin) plasma
Pregnancy Test	Serum Urine	Negative	If urine is used, the first morning voided sample is the specimen of choice
Prolactin	Serum	Males: 2.5- 17.0 ng/mL Females: Non-pregnant: 1.9 - 17.0 ng/mL Pregnant: 9.7 - 208.5 ng/mL Postmenopausal: 1.8 - 20.3 ng/mL	
Progesterone	Serum	Male:0.27 - 0.9 ng/mL Female: Follicular:ND - 1.13 ng/mL Luteal: 0.95 - 21 ng/mL Mid-luteal: 6.0 - 24 ng/mL Post-menopausal: ND - 1.0 ng/mL	
PSA	Serum	0 - 4 ng/mL	
Rheumatoid Factor (RF)	Serum/Plasma	Negative	Performed daily. If positive, quantitative is performed.
Rubella M	Serum		
Rubella G	Serum		

Salicylate	Plasma	<30 mg/dL	**Plasma Critical Value: >30 mg/dL** Concentrations > 30 mg/dL are considered toxic. Concentrations greater than 60 mg/dL can be lethal. Heparinized (lithium heparin) plasma; Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Sodium	Plasma Urine	136 - 144 mmol/L 40 - 220 mmol/L	**Plasma Critical Value: <120 or >160 mmol/L** Heparinized (lithium heparin) plasma
Testosterone	Serum	Male Age 0-49 yrs: 286 - 1510 ng/dL Male Age >/= 50: 212 - 742 ng/dL Female: 65 - 119 ng/dL	
Theophylline	Plasma	5-10 ug/mL Peak <1.4 ug/mL Trough	In some cases, the most effective therapeutic level may be outside these ranges. Heparinized (lithium heparin) plasma; Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Thyroid Stimulating Hormone (TSH)	Serum	0.400 - 4.000 uIU/mL	TSH is performed as a screen for thyroid abnormalities, if the TSH is abnormal a Free T4 is automatically performed.
Tobramycin	Plasma	Trough: <1 ug/mL Indicate time of collection and label peak or trough	Critical Value (trough): >2.1 ug/mL Trough should be drawn immediately prior to dose administration. Peak should be drawn one hour after dose administration. Heparinized (lithium heparin) plasma; Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Total Iron Binding Capacity	Plasma	250 - 450 ug/dL	Calculated with FE Panel.
Total Protein	Plasma CSF	6.1 - 7.9 g/dL 15 - 45 mg/dL	Heparinized (lithium heparin) plasma

Transferrin	Plasma	Male: 202 - 364 mg/dL	Serum is the recommended specimen
Triglycerides	Plasma	< 200 mg/dL	Fasting specimen is required. Blood should be collected after a 12-hour period of fasting. Serum or plasma should be removed from cells within 2 hours of venipuncture
Troponin I	Plasma	<0.0 - 0.05 ng/mL	Any condition resulting in myocardial cell damage can potentially increase cardiac Troponin I levels above the expected value. Clinical studies have documented these conditions to include unstable angina, congestive heart failure, myocarditis, and cardiac surgery or invasive testing. Use of this test should reflect current practice and criteria for AMI diagnosis. Serial sampling may be required to detect elevated levels. Heparinized (lithium heparin) plasma
Uric Acid	Plasma . Urine	Male: 2.6 - 7.2 mg/dL Female: 2.6-8.0 mg/dL 250-750 mg/24 hrs	Heparinized (lithium heparin) plasma
Urinalysis	Random Urine		
Glucose:		Negative	
Bilirubin:		Negative	
Ketones:		Ketones	
Specific Gravity:		1.005 - 1.025	
Blood:		Negative	
pH:		5.0 - 7.5	
Protein:		Negative	
Urobilinogen:		0.2 -1.0 mg/dL	
Nitrite:		Negative	
Leukoesterase:		Negative	
Vitamin B12	Serum	Normal: 193 - 982 pg/mL	

Urine, 24 Hours	Urine. Containers with appropriate preservatives are available in the laboratory. Specimens that do not require a preservative are kept on ice or refrigerated until submitted. Written instructions are provided to the patient. See text for collection directions.	See individual tests	Performed once daily on normal duty days.
Urine, Drugs of Abuse	Amphetamine/Meth Barbituate Benzodiazepine Cannabinoid Cocaine Metabolite Opiate Phencyclidine PCP	Negative Negative Negative Negative Negative Negative Negative	This is a medical test only. (LEGAL drug screens are referred to Brooks AFB, Texas as part of the Air Force Drug Screening Program.) All POSITIVE drug screens are held for one month.
Valproic Acid	Plasma	50 - 100 ug/mL	**Critical Value: 110.1 ug/mL** Heparinized (lithium heparin) plasma. Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
Vancomycin	Plasma	Trough: 5 - 10 ug/mL Peak: 30 - 40 ug/mL Indicate time of collection and label peak or trough	**Critical Value: <10.1 ug/mL** **Critical Value: <40.1 ug/mL** Trough samples should be drawn immediately prior to dose administration. Peak samples should be drawn one hour after dose administration. Heparinized (lithium heparin) plasma, Non gel tube is recommended. Remove plasma from cells within 15 minutes of centrifugation.
	NOTE: Serum Specimens = Red Top Tubes; Plasma Specimens = Green Top (Lithium Heparin) Tubes		

HEMATOLOGY / HEMOSTASIS

Test	Specimen	Reference Range	Comments
Activated Partial Thromboplastin Time (APTT)	Citrated Plasma	23.0 - 36.9 seconds	Critical Value: > 90 seconds
APT Test	Gastric Contents	Negative	This test is used to differentiate between fetal and maternal blood in the gastric contents of a neonate.
Body Fluid Examination	Various Body Fluids Collected in EDTA or Heparin to prevent clot formation; CSF collected in designated CSF collection tubes	Reference Ranges are dependent on the fluid type analyzed and can be found in CHCS/AHLTA or as part of the patient report	
CBC with Differential	Whole Blood (EDTA)		
WBC Count:		4.5 - 11.0 x103/mm3	Critical Value: <2 or >37 x 103/mm3
RBC Count:		4.3 - 5.9 x106/mm3	
Hemoglobin:		13.9 - 16.3 gm/dL	Critical Value: <7 or >20 g/dL
Hematocrit:		39 - 55 %	Critical Value: <15 or >65%
MCV:		79 - 100 fL	
MCH:		25.4-34.6	
MCHC:		30 - 37 %	
RDW:		11.5-14.5%	
Platelet Count:		150 - 450 x103/mm3	Critical Value: <40 or >999 x 103/mm3
MPV:		7.4 - 10.4 fL	
Neutrophil %:		35.2 - 78.5 %	
Lymphocyte %:		16 - 39 %	
Monocyte %:		1.4-11.60%	
Eosinophil %:		0 - 5.5 %	
Basophil %:		0 - 2 %	
Neutrophil Count:		1.6 - 8.8 x 103/mm3	
Lymphocyte Count:		1.25 - 3.38 x103/mm3	
Monocyte Count:		0.13- 0.86 x103/mm3	
Eosinophil Count:		0 - 0.4 x103/mm3	
Basophil Count:		0 - 0.2 x103/mm3	
			All reference ranges shown are for adult males. Age and sex specific ranges are available in CHCS/AHLTA and are printed on each patient report.
D-Dimer Profile includes:	Citrated Plasma		
D-Dimer (Auto)		<0.04 FEU ug/mL	
D-Dimer		<200 mg/mL	

Eosinophil Count	Nasal Smear Urine	Abnormal: Few or more: Not normally found in urine	
Erythrocyte Sedimentation Rate (ESR)	Whole Blood (EDTA)	Male: 0-50 y/o: 0-15 mm/hr > 50 y/o: 0-20 mm/hr Female: 0-50 y/o: 0-20 mm/hr > 50 y/o: 0-30 mm/hr	
Fibrin Degradation Products (FDP)	Citrated Plasma	< 5.0 ug/mL	
Fibrinogen	Citrated Plasma	168 - 435 mg/dL	Critical Value: <75 or >775 mg/dL
International Normalized Ratio (INR)	Citrated Plasma	1.0, varies according to therapeutic condition being followed	INR is part of the normal Protime (PT) procedure and will be reported along with PT values.
Leukocyte Alkaline Phosphatase (LAP score)	Peripheral Blood	32 - 182	Used primarily to differentiate a leukomoid reaction from chronic myelocytic leukemia, contact laboratory to schedule study.
Mixing Studies	Citrated Plasma	See CHCS/AHLTA	Used to differentiate factor deficiency from presence of inhibitors as causes of abnormal PT and APTT. Contact pathologist for assistance with interpretation.
Platelet Aggregation	Platelet-Rich Plasma	Interpreted by pathologist	Call hematology lab to schedule.
Protime (PT)	Citrated Plasma	11.3 14.2 seconds	Critical Value: >51 seconds
Reticulocyte Counts	Whole Blood (EDTA)	Adults: 0.5-1.5% Infants: 2.0-6.0%	
Thrombin Time	Citrated Plasma	<21.0 seconds	

MICROBIOLOGY		
Test	**Specimen Collection**	**Comments**
Abscess--Open	Remove surface exudate by wiping with 70% alcohol or sterile saline. Aspirate, if possible or pass swab deep into lesion and firmly sample lesions advancing edge	Tissue or fluid is always superior to a swab.
Abscess--Closed	Clean area with 70% alcohol or sterile saline. Aspirate abscess wall material with syringe. Remove needle, cap syringe, and transport immediately.	Should also be submitted for anaerobic culture.
Anaerobes-Syringe	Obtain deep aspirate, expel ALL air bubbles and cap needle.	Submit to lab immediately; Deep aspirates have a 30% better recovery rate for anaerobes than do swabs. The use of blood culture bottles for collection of anaerobic fluids or other than blood is discouraged.
Anaerobes--BD Anaerobic Container	Place swab or aspiration into the inner tube of the container. Press down on the flat disc portion of the plunger until it contacts the rubber stopper. Submit to lab immediately	Submit to lab immediately. DO NOT use the Culturettes labeled "Aerobe and Anaerobes (4360210) for collection and Transport System. This system will not recover all obligate anaerobic pathogens.
Anaerobes-Tissue	Collect the specimen close to the base of the wound rather than superficially Abscess material should include pus along with a portion of the abscess wall. Submit to lab immediately	Submit to lab immediately. Submit one half to surgical pathology in the appropriate fixative and submit the other half in a wide-mouthed screw-capped sterile collection container. DO NOT add fixative to the tissue specimens for culture.
Blood Cultures:	PROCEDURE: Cleanse the venipuncture site with an alcohol pad. Apply 2% iodine, or an iodophor solution in concentric fashion from a central point to the periphery of the site. Leave iodine on the skin for at least 1 minute. DO NOT touch the cleansed venipuncture site., remove residual iodine from arm, after venipuncture, with an alcohol pad.	Gram stains will not be performed on blood culture bottles. Bottles must be properly filled and labeled. They are continuously monitored for a five day period.
	General Info:	BOTTLES: Check expiration date, remove the sterile protective cap, and cleanse the vial top with 70% alcohol. Using the original syringe and needle (DO NOT change the syringe needle), dispense required volume into each bottle. Label the sides of the vials with the current date, date of birth, time, your initials, the patient's full name and SSAN or register number. If using labels, do not place over bar code area.

Blood Culture-Routine	8-10 cc of blood in an aerobic bottle (blue label)	If initiating immediate antibiotic therapy, submit 10 cc of blood from each of two separate venipuncture sites in standard aerobic/anaerobic bottles. If antibiotics already started-innoculate charcoal pediatric (yellow) bottles.
Blood Culture-Anaerobic	8-10 cc of blood in an anaerobic bottle (purple label)	Indicated for patients with sepsis, intra-abdominal abscess or necrotizing colitis. Use anaerobic bottle in addition to at least two routine cultures
Blood Culture-Pediatric	1-4 cc (yellow label) for small volume collections	Use for pediatric and difficult to collect patients. Available at ICU, 3A, and the Emergency Room.
Body Fluids (other than Blood, Urine and CSF)	Collect specimens using strict sterile technique.	Transport immediately to the laboratory. (also see anaerobic cultures.) Specimens may require an anticoagulant to prevent clotting (contact Microbiology for collection tube type. DO NOT inoculate body fluids into blood culture vials without prior consultation with Microbiology personnel.
Bone Marrow	Inoculate marrow directly into blood culture vials or submit in green top heparinized tubes if direct specimen plating is required	Submit peripheral blood culture, also
Brucella		Contact Shipping Dept. for instructions
C. Difficile Toxin A/B	Freshly passed feces is the specimen of choice. Submit in cardboard container and transport immediately.	DO NOT send multiple specimens, one sample is sufficient for diagnosis.
Campylobacter		See Stool
Catheter Tip	Cleanse catheter insertion site with alcohol and allow site to dry. Withdraw catheter aseptically. DO NOT allow catheter to touch surrounding skin. Use sterile scissors to cut tip.	Submit catheter tip (i.e., the length below the skin-catheter interface) in a dry sterile container. Only cultures with greater than 15 Colony Forming Unit (CFU) are worked up. Gram stains WILL NOT be done on catheter tips.
Chlamydia/GC Panel	Consult collection kit package for collection technique. Nucleic Acid Analysis: Genitourinary Tract sites	Transport to Microbiology section ASAP.
	Other than Genitourinary tract Sites	Consult the Shipping Dept. for instructions.
CSF	Perform aseptic lumbar puncture. Place at least 1cc in supplied CSF collection tubes.	Submit first tube for microbiologic studies (culture).
Ear-External	Using a swab, collect material from the active lesion margin.	Diagnosis of otitis media is usually attempted only in cases of therapeutic failure or in neonates

	Avoid skin contamination	
Ear-Internal	Collect by needle aspiration through the eardrum (tympanocentesis).	
Eye	Collect conjunctival swabs or scraping, or intraocular fluid by needle aspiration.	Deliver to the laboratory immediately.
Fungal	Collect the material from the active border of a lesion, or scrape away the surface scaling and obtain scales from well under the raised nails. In some skin lesions, vesicles are present. Carefully clip these off with sterile scissors. The roofs of vesicles frequently contain actively growing fungal elements.	
Group B Streptococcus	Swab the lower vagina, followed by the rectum using the same swab or two different swabs. Note: If susceptibility testing is ordered for penicillin-allergic women, specimen labels should also identify the patient as penicillin allergic and should specify that susceptibility testing for clindamycin and erythromycin should be performed if GBS is isolated.	
(GC) Neisseria gonorrheae		Contact Microbiology for instructions
Gonoccoccal (GC) Culture: General Info.		Obtain Thayer Martin plates from Bacteriology. Allow plates to warm up to room temperature before use. INNOCULATION: Immediately apply collected material to Thayer Martin plates. Transport to the laboratory immediately.
GC/Chlamydia Panel	Consult collection kit package for collection technique. Nucleic Acid Analysis: Genitourinary Tract sites	Transport to Microbiology section ASAP.
	Other than Genitourinary tract Sites	Consult the Shipping Dept. for instructions.
Gonoccocal (GC) Anal Culture	Anorectal specimens are obtained form the crypts just inside the anal ring.	See comments area (General Info.) for culture submission criteria

Gonoccocal (GC) Cervical Culture	Wipe cervix clean of vaginal secretions and mucus. A cervical (not vaginal) culture is collected under direct visualization.	If pelvic examination suggests vaginal glands or the urethra are involved, swab these areas for cultures. See comments area (General Info.) for culture submission criteria
Gonoccocal (GC)	Pharyngeal specimens are obtained from	See comments area (General Info.) for culture submission criteria
Pharyngeal Culture	the tonsillar regions and posterior pharynx	
Gonoccocal (GC) Urethral (male or female) Culture	Collect the discharge or sample the urethral canal (2-3 cm) using a calcium alginate swab with a flexible wire.	Urethral swabs are collected prior to or 1 hour after urination. See comments area (General Info.) for culture submission criteria
Gonoccocal (GC)		
Genitourinary tract		
Nucleic Acid Analysis	Consult collection kit package for collection technique.	Transport to Microbiology section ASAP.
Gonoccocal (GC) Sites other than Genitourinary tract		Consult Microbiology for instructions
Occult Blood	If only fecal occult blood is requested, inoculate Hemoccult cards according to provided directions.	
Ova & Parasites General Info.	Collect 3 stool specimens over a one week period.	UNACCEPTABLE SPECIMENS: Mineral/castor oil, particulate substances (Metamucil) (within 3 days); Barium for gastrointestinal series (within 3 weeks); Gallbladder dye (within 3 weeks); Any iodine preparations or anti-amoebic treatment (within 3 weeks); Swabs; Timed (i.e., 24 or 72 hour specimens for fecal fat analysis); Diapers are unacceptable; All O&P exams include screening for Cryptosporidium and Giardia; QUANTITY: Analysis requires a "walnut" sized specimen or equivalent liquid specimen.
Ova & Parasites Formed Stool		Specimens can be refrigerated; If delay in transport is unavoidable, place a portion of the specimen directly into 10% Formalin & PVA fixatives.
Ova & Parasites Liquid Stool		Deliver to the laboratory immediately

Pinworm Prep	Collect early in the morning before the patient wipes or scratches the anal area & disseminates the eggs. Spread the buttocks to expose the anus. Press the sticky side of the pinworm paddle against the anal meatus. Try not to include fecal material. Place the paddle back into the transport device to prevent exposure to eggs.	Stool material is unacceptable for pinworm detection. The commercial plastic pinworm "paddles" are the only acceptable specimen
Respiratory-Nasopharyngeal	Obtain with a Dacron, Rayon or Calcium alginate swab on a flexible wire. Pass gently through the nose into the nasopharynx, rotate, remove and place into provided transport media.	Contact Shipping Dept. for unusual pathogen collection requirements (i.e., Bordetella Pertussis, Mycoplasma,Corynebacterium Diptherium etc.
Respiratory-Sputum (non TB)	The patient expectorates into a sterile collection container such as the one used for sterile urine collections.	Sputum samples are collected in the early morning. A single (good quality) specimen is usually sufficient. The minimum sample is 5.0 ml. Indicate if patient is neutropenic, immunocompromised, newborn or CF patient
Respiratory-Throat	Depress the tongue with a tongue blade to minimize contamination. Obtain culture under direct visualization with a culturette swab by vigorously swabbing both tonsilar areas, the posterior pharynx, and any areas of inflammation, ulceration, exudation or capsule formation.	Call Microbiology when organisms other than Streptococcus Group A are suspected.
		Throat cultures are contraindicated for patients with inflamed epiglottitis.
RSV-Respiratory Syncytial Virus	Submit 1 mL of nasopharyngeal (NP) aspirate. Deliver to the laboratory immediately	NP swabs are acceptable but some detection sensitivity is lost. Submit swab with saline.
Skin--KOH Prep	Cleanse affected area with 70% alcohol. Gently scrape surface of active margin of lesion (do not draw blood). Place sample in clean container	Try to provide enough scrapings to cover an area the size of the head of a thumbtack. If specimens are submitted on glass slides, tape slides together and submit in envelope or petri dish.
Skin-Pustule	Cleanse affected area with 70% alcohol. Remove any crusty (scab) material and attempt to remove exudate from base of lesion with culturette.	In the absence of lesions, specimens are of little value.
Stool-Feces	Collect stool in a clean dry stool container. It is recommended that samples are collected daily for three consecutive days to help in the recovery of any pathogen.	Deliver the specimen to the laboratory immediately. DO NOT refrigerate. Stools are routinely examined for Salmonella, Shigella, and Campylobacter and E. coli 0157-H7, Vibrio, Yersinia, Staphylococcal enterocolitis or C. difficile toxin are ordered separately. Diapers are unacceptable.

Stool-Rectal Swab	Pass the swab beyond the anal sphincter, carefully rotate and withdraw. Place the swab back into its holder and crush the preservative ampule.	Deliver the specimen to the laboratory immediately. DO NOT refrigerate. A rectal swab IS NOT a suitable specimen for C. difficile toxin.
Throat		see respiratory-throat
TB		see respiratory-sputum (TB)
Trichomonas		See Wet Prep
Urine Clean-catch Midstream (male)	Cleanse glans with provided antiseptic pad. Retract foreskin, if necessary, and begin voiding. Collect urine in provided container when bladder "feels" half empty.	DO NOT stop flow of urine during collection. Room temperature urine must be processed within 2 hours of collection. Refrigeration for 2-4 hours is acceptable but transport samples at earliest opportunity so that cultures are not delayed
Urine Clean-catch Midstream (female)	Cleanse urethral area with provided antiseptic pad, wiping towards the anus. While holding labia apart, begin voiding and collect urine in provided container when bladder "feels" half empty.	DO NOT stop flow of urine during collection. See above comments for storage.
Urine Catheter	Aspirate urine sample with a syringe after disinfecting the sampling port with alcohol. Place in sterile urine container and transport to lab.	Urinary catheter tips and timed urines are unacceptable for culture.
(indwelling)		The connection between the catheter and the drainage tube is not broken for specimen collection. Material submitted for culture SHOULD NOT be taken from the drainage bag.
Vibrio		See Stool
Urine Suprapubic	Prep site with alcohol followed by iodophor. Wait one minute before performing procedure. Aspirate bladder urine and transport sample immediately to the lab	
Wet Prep Trophozoites or Yeast	Collect specimen with a sterile cotton swab and small amount of physiological saline. Place swab and saline in a small test tube.	Deliver to the laboratory immediately.
Wound		See Abscess

Yersinia		See Stool

SEROLOGY

Test	Specimen	Reference Range	Comments
Antinuclear Ab (ANA)	7 mL Red Top	Negative	Batch tested; Performed Monday-Friday
Bacterial Ag Detection	CSF, Serum, Urine	Negative	CSF available STAT 24 hours. Serum & Urine; Routine only. Negative CSF is followed up with culture.
Cryptococcal Ag Latex Test	7 mL Red Top		
1 mL CSF	Negative	STAT 24hrs on CSF only. Monday-Friday	
Serum: Routine			
IM - Infectious mononucleosis	7 ml Red Top	Negative	Performed Daily: Monday-Friday
Influenza A/B			
(FLU A/B)	Nasal -Pharingeal		
Aspirate/Wash	Negative	Available STAT 24 hours; 1 ml is consider optimal; must be bring directly to Microbiology dept.	
Respiratory Syncytial Virus (RSV)	Nasal Pharnygeal aspirate/wash	Negative	Available STAT; 1 ml is consider optimal. Bring directly to Microbiology. Performed 24 hours.
RPR	7 mL Red Top	Negative	Performed Daily. If positive, test is sent out for confirmation.

MOLECULAR GENETICS

Test	Specimen	Comments	Shipping Requirements
ANGELMAN SYNDROME UBE3A DNA	BLOOD/LAV	Recommended 3 - 5 mLs	
	TISSUE		Collect and ship only Monday – Thursday, must ship Next Day Air.
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
AZOOSPERMIA DELETION	BLOOD/LAV	Recommended 3 - 5 mLs	
	TISSUE		Collect and ship only Monday – Thursday, must ship Next Day Air.

	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
CONNEXIN 26 DNA SEQUENCE	BLOOD/LAV	Recommended 3 - 5 mLs	
	TISSUE		Collect and ship only Monday – Thursday, must ship Next Day Air.
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
CYSTIC FIBROSIS PRENATAL SCRN	BLOOD/LAV	Recommended 3 - 5 mLs	
	TISSUE		Collect and ship only Monday – Thursday, must ship Next Day Air.
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
CYSTIC FIBROSIS 5T ALLELE	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
CYSTIC FIBROSIS MUTATION ANALY	BLOOD/LAV	Recommended 3 - 5 mLs	
	TISSUE		Collect and ship only Monday – Thursday, must ship Next Day Air.
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
FACTOR V LEIDEN MUTATION	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
FRAGILE X SYNDROME PCR	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		

	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
FRIEDREICH ATAXIA DNA	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
HEMOCHROMATOSIS DNA	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
HUNTINGTON'S DISEASE DNA	BLOOD/LAV	If this patient has a relative with Huntington's Disease, you must contact the Keesler Genetics Lab at DSN 597-6393/9256 prior to ordering. Special paperwork is required. Recommended 3–5 mLs blood.	Collect and ship only Monday – Thursday, must ship Next Day Air.
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5; If this patient has a relative with Huntington's Disease, you must contact the Keesler Genetics Lab at DSN 597-6393 / 9256 prior to ordering. Special paperwork is required.	
MECP2 SEQUENCE RETT SYNDROME	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
MTHFR DNA ANALYSIS	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
MYOTONIC DYSTROPHY	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	

PRADER-WILLI SYNDROME DNA	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
PROTHROMBIN G20210A MUTATION	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
SPINAL MUSCULAR ATROPHY	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
SPINOCEREBELLAR ATAXIA PROFILE	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
SPINOCEREBELLAR ATAXIA TYPE 1	TISSUE		
SPINOCEREBELLAR ATAXIA TYPE 2	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	
SPINOCEREBELLAR ATAXIA TYPE 3			
SPINOCEREBELLAR ATAXIA TYPE 6			
SPINOCEREBELLAR ATAXIA TYPE 7			
SPINOCEREBELLAR ATAXIA TYPE 8			
SRY SEQUENCES PCR	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.
	TISSUE		
	AMNIOTIC FLUID/BLOOD LAV	Maternal blood sample (LAVENDER TOP), Recommended 3 - 5 mLs, with Amniotic Fluid.	

Y-MICRODELETION	BLOOD/LAV	Recommended 3 - 5 mLs	Collect and ship only Monday – Thursday, must ship Next Day Air.

Specimen Rejection Criteria:

- Improperly shipped specimens (e.g., specimens that are leaking).
- Grossly Hemolyzed or clotted specimens.
- Frozen specimens.
- Specimens over 4 days old (specimens for DNA testing may be accepted, although a redraw may be necessary).
- Specimens that are improper for the test (e.g., serum shipped for chromosome study).
- Tissue samples that are leaking fluid.
- Unlabeled, mislabeled, or illegibly labeled specimens when positive patient identification cannot be guaranteed.
- Separate shipping. ***DO NOT*** ship genetic specimens with cytology or pathology specimens. Doing so will delay receipt of the specimens in the proper laboratory.

Rejected specimens (e.g., leaking, frozen) are ***discarded*** and the shipping facility notified.

Specimen Packaging:

- Packing instructions for chromosome or DNA referral specimens: Wrap the specimen in paper towels or gauze.
- The specimen should also be placed in a plastic bag and sealed. Cushion the specimen in a styrofoam box.
- Seal the Styrofoam box with tape. Place the Styrofoam box in a cardboard box for shipping. Ship at room temperature.
- Ship all specimens to arrive by overnight delivery. Specimens ***must*** reach us within 24-48 hours after collection (***exception***--delays of more than 5 days should be avoided for specimens for DNA testing).
- Please ***DO NOT*** use regular mail or military transportation. If priority mail is the only method of shipping, clearly mark in large print that the package contains a biological sample.
- Please ***DO NOT*** ship specimens FedEx **collect**. These packages will not be accepted.

Please ***DO NOT*** ship specimens to arrive on Saturday, Sunday, or Holidays since the laboratory is not staffed on these days.

CYTOGENETICS

Test	Specimen	Comments	Shipping Requirements
CHROMOSOME ANALYSIS	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!

CRI-DU-CHAT SYNDROME	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
DIGEORGE SYNDROME	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
FISH, OTHER TEST	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
KALLMAN SYNDROME	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
MILLER-DIEKER	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
SMITH-MAGENIS SYNDROME	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
VELOCARDIOFACIAL SYNDROME	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
WILLIAMS SYNDROME, FISH	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!
WOLF-HIRSCHHORN SYNDROME	BLOOD: SODIUM HEP/GRN	Recommended 4 – 6 mLs blood.	Collect and ship only Monday - Thursday, must ship Next Day Air. SPECIMEN MUST BE RECEIVED AT AF GENETICS LAB TUESDAY - FRIDAY!!!

Specimen Rejection Criteria:

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- Grossly Hemolyzed or clotted specimens.
- Frozen specimens.
- Specimens over 4 days old (specimens for DNA testing may be accepted, although a redraw may be necessary).
- Specimens that are improper for the test (e.g., serum shipped for chromosome study).

- Tissue samples that are leaking fluid.
- Unlabeled, mislabeled, or illegibly labeled specimens when positive patient identification cannot be guaranteed.
- Separate shipping. ***DO NOT*** ship genetic specimens with cytology or pathology specimens. Doing so will delay receipt of the specimens in the proper laboratory.

Rejected specimens (e.g., leaking, frozen) are ***discarded*** and the shipping facility notified.

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